RE: Docket No. RCA 88228

**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES**

Applicant: Kranawetter et al. Art Unit: 2613

Serial No.: 09/319,324 Examiner: Behrooz M. Senfi

Filed: June 3, 1999

Title: PARALLEL DECODING OF INTERLEAVED DATA STREAMS WITHIN AN MPEG DECODER



**APPLICANTS' APPEAL BRIEF**

For the reasons set forth below, Applicant respectfully requests that the examiner's Final Rejection dated October 2, 2003 be reversed and all claims be allowed. The following background information is provided in accordance with 37 CFR §1.192(c).

Please charge any additional fee or credit any overpayment to the above-identified Deposit Account.

Three copies of the Brief are enclosed. This page is also submitted in duplicate for fee charging purposes.

Applicants do not request an oral hearing.

REAL PARTY IN INTEREST

The real party in interest is Thomson Consumer Electronics, Inc., a corporation of Delaware, the assignee of this application.

## RELATED APPEALS AND INTERFERENCES

There are no other appeals or interferences that will affect, or be affected by, or have a bearing on the Board's decision in this appeal.

## STATUS OF CLAIMS

Claims 1 – 15, all of the original claims, are the only claims pending and all are appealed.

Claims 1 – 15 stand rejected under 35 U.S.C. 103(a) as being unpatentable over Park, U. S. Patent No. 5,675,424 in view of Yoon et al., European Patent Specification EP 0688135.

## STATUS OF AMENDMENTS

All submitted amendments have been entered, including an amendment filed in July 2003 in response to the First Office Action in a CPA application filed in this case. The Examiner cited Yoon in combination with Park for the first time in the Final Rejection which led to this Appeal.

## SUMMARY OF THE INVENTION

Various arrangements are known which are capable of processing High Definition Television (HDTV) signals encoded according to standards promulgated by the Motion Picture Experts Group (MPEG).

In accordance with the present invention, a source of MPEG encoded compressed pixel data blocks 10 (FIG. 2) provides a datastream of MPEG coded image data to an interleaving means (multiplexer) 15. Interleaving means 15 is arranged for separating the MPEG coded

datastream into particularly configured first (P1) and second (P2) datastreams (FIGS. 1 - 4). The first datastream P1 is constituted by a first predetermined sequence (see FIG. 5) of interleaved first and second spatially adjacent pixel block components (e.g., "a" and "c" components) while the second datastream P2 is constituted by a second predetermined sequence of interleaved third and fourth spatially adjacent pixel block components (e.g., "b" and "d" components – FIG. 6).

This separation of pixel block components of the MPEG datastream is particularly arranged "for producing decoded image information selectable for producing either high resolution or reduced data image reproduction of a complete image". (independent claim 1 and similar language in each of independent claims 7 and 13).

ISSUES

There is only one principal issue – does Park disclose or suggest anything "for producing decoded image information selectable for producing either high resolution or reduced data image reproduction of a complete image" (or the similar language at the end of claims 7 and 13) as required by each of Appellant's claims ?

A secondary issue for the Board is whether there is any suggestion or motivation in either reference to combine them and/or to modify either or both references in any manner to arrive at the several combinations set forth in the rejected claims.

GROUPING OF CLAIMS

Claims 1 – 6 stand as one group (apparatus claims), claims 7 – 12 stand as a second group (first method claims) and claims 13 – 15 stand as a third group (second method claims).

ARGUMENT

Rejection of Apparatus Claims 1 – 7 Under 35 U.S.C. 103(a)

With respect to the rejection of claims 1 – 6, (particularly independent claim 1), the Examiner has not indicated anything in the cited references which meets the language "for producing decoded image information selectable for producing either high resolution or reduced data image reproduction of a complete image" (claim 1). To fill this gap, the Examiner states at the end of the rejection of claim 1, apparently with respect to Park:

"(whole purpose of dividing the bit stream to multiple bit streams and processing through multiple encoders and decoders are to make the signal selectable/suitable for high/low resolution based on the desired application)".

Neither Park nor Yoon says any such thing.

In fact, the principal figures (FIGS. 2, 3A and 3B) and related text in Park on which the Examiner relies do not describe Park's invention but are included in Park's "Description of the Prior Art". It is quite clear from Park's description of such "prior art" that a very different approach is taken in that prior art than is presently claimed.

First of all, as described by Park, the prior art system uses a technique of "slicing" the overall image into horizontal, multi-line "subpictures" P1 - Pn (see Park, FIG.2) and processing each of those slices in a separate decoder.

In the "Background of Invention" portion of Park, referring to the "Prior Art" shown in FIGS. 1 – 3B, Park states:

"conventional image encoder section and decoder section (which) apply a parallel processing method with division of picture", i.e. "one frame image is divided into subpictures P1 through Pn and image data on respective subpictures are parallel-signal processed by

encoders (or decoders) operated individually, and the signal process for the overall frame is completed by summing the outputs of the respective encoders",

all of which is undertaken

"to process a video signal with a clock signal having a relatively lower frequency" (col. 1, lines 43 – 52).

Thus, Park describes the objective of the prior art system as follows (Park, col. 1, lines 43 – 46):

> "The conventional image encoder section and decoder section apply a parallel processing method with division of picture to process a video signal <u>with a clock signal having a relatively lower frequency"</u> (emphasis added)

Park is referring to a "relatively lower frequncy" as compared to the clock frequency of 75 MHz used to digitize the original HDTV signal. Park goes on to say "the signal process for the overall frame is completed by summing the outputs of the respective encoders." (col. 1, lines 51 – 53).

There is no mention whatsoever of " producing decoded image information selectable for producing either high resolution or reduced data image reproduction of a complete image" as required by claims 1 – 6.

Yoon is totally silent on this aspect of Appellant's claimed combination.

Each of claims 1 – 6 therefore is clearly patentable over the cited art and should be allowed.

<u>Rejection of Claims 7 – 12 Under 35 U.S.C. 103(a)</u>

With respect to method claims.7 – 12, independent claim 7 requires:

"said producing step comprises producing multiple datastreams, each datastream having a different predetermined sequence of mutually interleaved pixel block components selectable

for either high resolution or reduced resolution data image reproduction modes for a complete image".

The "prior art" disclosure in Park on which the Examiner has relied neither discloses nor suggests any such datastreams which are "selectable for either high resolution or reduced resolution, etc." as pointed out above.

Yoon is silent on this aspect of the claimed method.

Each of method claims 7 – 12 is therefore submitted to be patentable over the cited art.

Rejection of Claims 13 – 15 Under 35 U.S.C. 103(a)

With respect to method claims 13 – 15, independent claim 13 requires:

"decoding said first and second datastreams to produce decoded image information selectable for reproducing complete images in either high resolution or reduced resolution image reproduction modes."

The "prior art" disclosure in Park on which the Examiner has relied neither discloses nor suggests "decoding" any such datastreams "to produce decoded image information selectable for reproducing complete images in either high resolution or reduced resolution, etc." as pointed out above.

Yoon is silent on this aspect of the claimed method.

Each of method claims 13 – 15 is therefore submitted to be patentable over the cited art.

COMBINATION OF REFERENCES

The Examiner cited Yoon '135 in the Final Rejection since "Park '424 fails to explicitly teach the newly added limitation "spatially adjacent pixel"". It is recognized that Yoon discloses "carrying out a parallel processing by dividing a macro block into four subblocks" (col. 2, lines 46 – 48). However, Yoon does not mention first and second datastreams , each with two interleaved spatially adjacent pixel block components as recited in the rejected claims. In addition, Yoon is silent, as noted above, regarding other specific elements recited in each of

the claims on appeal. As such, it is respectfully submitted that there is no basis for combining Yoon with Park to support a rejection of such claims.

CONCLUSION

The cited prior art is totally lacking in any disclosure or mention of an element of each of the rejected claims. There is no basis for concluding that such claims are unpatentable under 35 USC 103 (a).

In view of the foregoing, reversal of the Examiner's rejection and allowance of claims 1 - 15 are respectfully requested.

Respectfully submitted,

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March 1, 2004

*CERTIFICATE OF MAILING*

I hereby certify that this amendment is being deposited with the United States Postal Service as First Class Mail, postage prepaid, in an envelope addressed to the Commissioner for Patents; P.O. Box 1450; Alexandria, VA 22313-1450 on:

March 1, 2004
Date

Linda Tindall

## APPENDIX

CLAIMS

Claim 1 An MPEG compatible digital signal processing system comprising:

an input network for receiving a data stream of MPEG coded data;

a coupling network responsive to said datastream for deriving therefrom a predetermined sequence of image data; and

an image signal processor responsive to said image data wherein

said coupling network comprises interleaving means responsive to said datastream of MPEG coded data for deriving therefrom at least first and second datastreams, said first datastream being constituted by a first predetermined sequence of interleaved first and second spatially adjacent pixel block components and said second datastream being constituted by a second predetermined sequence of interleaved third and fourth spatially adjacent pixel block components for producing decoded image information selectable for producing either high resolution or reduced data image reproduction of a complete image.

Claim 2 A system according to claim 1, wherein

said interleaved image data comprises data block components of an MPEG compatible macroblock containing pixel representative information.

Claim 3 A system according to claim 1, wherein:

said interleaving means produces a first datastream of interleaved first and second spatially adjacent pixel block components from each macroblock of said MPEG coded data and a second datastream of interleaved third and fourth spatially adjacent pixel block components from each macroblock of said MPEG coded data.

Claim 4 A system according to claim 3, wherein

Said first, second, third and fourth pixel block components are spatially adjacent components of an MPEG compatible macroblock.

Claim 5 A system according to claim 1, wherein said input network includes

a decoder for decoding said MPEG coded datastream; and

a decompressor for decompressing output signals from said decoder; wherein

said interleaving network responds to output signals from said decompressor.

Claim 6 A system according to claim 1 and further including

a memory for storing image representative data; and

a motion compensation network coupled to said memory; wherein

said image signal processor and said motion compensation network comprise a DPCM loop.

Claim 7 A method for processing a datastream of MPEG coded image representative data, comprising the steps of:

decoding said data to produce a decoded datastream;

producing from said decoded datastream a predetermined sequence of interleaved data blocks representing image pixels;

processing said data blocks; and

storing data blocks from said processing step; wherein

said producing step comprises producing multiple datastreams, each datastream having a different predetermined sequence of mutually interleaved pixel block components suitable selectable for either high resolution or reduced resolution data image reproduction modes for a complete image.

Claim 8 A method according to claim 7, wherein

said producing step produces a first datastream of interleaved spatially adjacent first and second pixel block components, and a second datastream of interleaved spatially adjacent third and fourth pixel block components.

Claim 9 A method according to claim 8, wherein

said interleaved pixel blocks comprise an MPEG compatible macroblock.

Claim 10 A method according to claim 7, wherein

said processing step includes DPCM processing of pixel data.

Claim 11 A method according to claim 10, wherein said DPCM processing step includes the further steps of

decompressing data blocks stored in said storing step; and

motion compensation processing decompressed data blocks produced by said decompressing step.

Claim 12 A method according to claim 9, wherein

said processing step comprises the steps of predicting pixel values and compressing pixel values.

Claim 13 A method for processing a datastream of MPEG coded image representative data, comprising the steps of:

receiving an input datastream of MPEG coded data;

decoding said input datastream to produce a decoded datastream of data blocks containing pixel representative information;

processing said decoded datastream of datablocks to produce therefrom a first datastream comprising at least first and second groups of data block components having pixel representative information interleaved in a first predetermined sequence, and a second datastream comprising at least third and fourth groups of data block components having pixel representative information interleaved in a second predetermined sequence; and

decoding said first and second datastreams to produce decoded image information selectable for reproducing complete images in either high resolution or reduced resolution image reprduction modes.

Claim 14 A method according to claim 13, wherein

said first group is constituted by first and second pixel blocks of an MPEG compatible macroblock; and

said second group is constituted by third and fourth pixel blocks of an MPEG compatible macroblock.

Claim 15 A method according to claim 14, wherein

said first, second, third and fourth groups comprise the same macroblock.